CLAIMS

1. A packet communication method comprising the steps of:

establishing a radio layer 2 connection based on a radio layer 2 protocol, between a mobile station and a controller device;

determining a transmission timing of a received data packet, based on a quality of service set in the data packet; and

multiplexing, at the determined transmission timing, the data packet into a radio layer 2 protocol data unit of a fixed length which is transmitted and received on the radio layer 2 connection.

2. A controller device comprising:

a radio layer 2 connection establishing unit configured to establish, with a mobile station, a radio layer 2 connection based on a radio layer 2 protocol;

a transmission timing determining unit configured to determine a transmission timing of a received data packet, based on a quality of service set in the data packet; and

a multiplexing unit configured to multiplex, at the determined transmission timing, the data packet into a radio layer 2 protocol data unit of a fixed length which is transmitted and received on the radio layer 2 connection.

3. The controller device as set forth in claim 2 further comprising a transmitting unit configured to transmit, by a transport technology, the radio layer 2 protocol data unit into

which the data packet is multiplexed.

4. A mobile station comprising:

a radio layer 2 connection establishing unit configured to establish, with a controller device, a radio layer 2 connection based on a radio layer 2 protocol;

a transmission timing determining unit configured to determine a transmission timing of a received data packet, based on a quality of service set in the data packet; and

a multiplexing unit configured to multiplex, at the determined transmission timing, the data packet into a radio layer 2 protocol data unit of a fixed length which is transmitted and received on the radio layer 2 connection.

5. The mobile station as set forth in claim 4 further comprising a transmitting unit configured to transmit, by a radio access technology, the radio layer 2 protocol data unit into which the data packet is multiplexed.

6. A packet communication method comprising the steps of:

at a mobile station, establishing a radio layer 2 connection based on a radio layer 2 protocol;

establishing a plurality of tunneling connections between two or more controller devices; and

at a first controller device, referring to a terminal address included in a data packet which is multiplexed on the radio layer 2 connection and transmitted from the mobile station, and relaying the data packet through a tunneling connection associated with the terminal address.

7. The packet communication method as set forth in claim 6 further comprising the steps of:

at the mobile station, transmitting a communication start request;

at the first controller device, transmitting a tunneling connection establishment request to a second controller device in accordance with the communication start request;

at the second controller device, establishing a tunneling connection with the first controller device in accordance with the tunneling connection establishment request, and associating the established tunneling connection with the terminal address; and

communicating the associated terminal address to the mobile station.

8. A controller device comprising:

a tunneling connection establishing unit configured to establish a plurality of tunneling connections with a certain controller device;

an associating unit configured to associate a terminal address included in a data packet with a tunneling connection;

a data packet receiving unit configured to receive a data packet which is multiplexed on a radio layer 2 connection and transmitted from a mobile station; and

a relay unit configured to refer to a terminal address included in the received data packet and relay the data packet through a tunneling connection associated with the terminal address.